What does 2016 herald, given that 2015 was another big year in medical technology? A Hospira Symbiq™ infusion pump was hacked. Drug costs soared, not only for novel new drugs, but also for some generics, as meetings convened about high costs and value pricing. Google transformed into Alphabet and extended its reach into various healthcare technology initiatives, including new robotic surgery platforms with real-time imaging and other data, which may soon give the company that has cornered the market for almost 20 years some stiff competition. And hospitals were on the hook again for serious adverse events such as contaminated duodendoscopes and healthcare-acquired infections.

New technology offers the promise of reducing organ transplant wait lists by improving the condition of lungs and hearts that are donated for transplantation and keeping them viable longer so they are acceptable for transplanting. New payment models put hospitals in the driver’s seat for the entire continuum of care for joint replacements starting in 2016. Hospital C-suite leaders must focus more than ever on creating higher value and excellent outcomes for lower costs.

ECRI Institute’s annual Top 10 Hospital C-suite Watch List includes both technologies and critical technology use issues that should be on your radar. It covers topics that will affect workflow, clinical processes, patient outcomes, staffing models, and capital funding needs.

The 2016 list examines 10 topics poised to affect care delivery, including:

1. **Mobile Stroke Units: Are They More Than a Concierge Ambulance Ride?**
2. **Medical Device Cybersecurity: When Will Your Pacemaker Be Hacked?**
3. **Wireless Wearable Sensors: Data Sense or Data Chaos?**
4. **Miniature Leadless Pacemakers: Will Potential Benefits Make a Difference?**
5. **Blue-violet LED Light Fixtures: Can the Flip of a Switch Help Prevent Healthcare-acquired Infections?**
6. **New High-cost Cardiovascular Drugs: Will They Help Your Readmission Rates?**
7. **Changing Landscape of Robotic Surgery: Is a Mainframe to Tablet-type Paradigm Change Coming?**
8. **Spectral Computed Tomography: What’s the New Hype About?**
9. **Injected Bioabsorbable Hydrogel (SpaceOAR): An End to Some Radiation Therapy Complications?**
10. **Warm Donor Organ Perfusion Systems: Will They Ease the Organ Supply Shortage?**

**LET’S EXPLORE THE NO. 1 ISSUE ON THE WATCH LIST: MOBILE STROKE UNITS.**

A mobile stroke unit (MSU) is a new concept that uses specially outfitted ambulances and a special staff model, telemedicine, and equipment to enable stroke diagnosis and prompt treatment at the patient’s location before transport to the hospital. The specially trained onboard team, in teleconsultation with a stroke neurologist, performs blood tests, takes computed tomography (CT) scans, and administers tissue plasminogen activator (tPA), if indicated, before a patient with stroke reaches the hospital.

This could be an important change in care delivery because about 87 percent of strokes are ischemic and stroke is a leading cause of death. Patients with stroke have long been treated with tPA to protect the brain if they meet criteria for tPA’s narrow therapeutic window (3.0 to 4.5 hours after symptom onset). But most stroke victims do not present in time for tPA treatment in the emergency department (ED), and fewer than 7 percent of affected patients receive tPA.

**THE FIRST STEP**

Four MSU programs are operating in the United States in urban areas, branching out to suburban areas. The first program started in May 2014 led by University of Texas Health Science Center in collaboration with Memorial Hermann-Texas Medical Center, CHI.
St. Lukes’ Health, Houston Methodist, and Ben Taub hospitals. The UTH ealth Mobile Stroke Unit operates in the greater Houston area seven days a week, 10 hours a day, every other week.

Another program started in July 2014 at the Cleveland Clinic in partnership with MetroHealth Hospital and Cleveland Emergency Medical Services (Cleveland MSU program). It operates from 8 a.m. to 8 p.m. each day every other week within a limited area of Cleveland. The Cleveland Clinic may expand its program to Palm Beach County, where it has a comprehensive stroke center. In mid-October 2015, Mercy Health System launched its Mercy Life Flight Network MSU, which it staffs 24/7.

The University of Colorado Health debuted its first MSU mid-January 2016, integrating it with its Epic electronic health record. During the initial 10-week pilot period, the MSU will operate Monday through Friday, 8 a.m. to 8 p.m. in Aurora, Colorado, then split its time between Aurora and UCHealth Colorado Springs. These programs were modeled after programs in Germany at Charite University and the University Hospital of Saarland.

An MSU program starts with an emergency response vehicle outfitted with appropriate staff, equipment, medicine, and on-scene and remote clinical personnel who communicate through telemedicine technology. The care team must have appropriate knowledge to recognize, distinguish, and treat different types of stroke where the mobile unit picks up the patient. Although MSUs focus primarily on ischemic stroke, they are also equipped to treat other types of stroke.

MSU equipment includes a portable CT scanner, tPA with infusion lines, mobile blood lab, telemedicine equipment with broadband access, and other medical equipment commonly found in an ambulance. MSU staff models include a paramedic, EMS driver, critical care nurse, CT technologist, and vascular neurologist onboard or available through telemedicine communication. The Houston MSU program uses Google Glass worn by onboard personnel to transmit images while MSU staff keep their hands free to tend to the patient.

Using telemedicine, remote stroke specialists can see and hear the patient, consult with first responders, and view test results. If appropriate, tPA is initiated before transport, and infusion continues during the drive. Patients with confirmed strokes are transported to a stroke center, while others may be transported to the closest ED. The receiving hospital then has the opportunity to activate its stroke response team.

WHAT TO DO IF YOU ARE CONSIDERING A MOBILE STROKE UNIT:

- Determine whether your health system’s current approach to treating stroke is meeting desired cost, quality, and patient and institutional outcomes goals.
- Determine whether your demographics support use of an MSU.
- Decide on your staffing model, additional equipment needs, and telemedicine capabilities.
- Coordinate with your local EMS dispatch services to create a response plan.
- Develop clinical protocols for use of MSU and how a hospital stroke team will function with an MSU team.

Stay tuned! In future issues of TechNation, we’ll take a deeper dive into more of the topics featured on ECRI Institute’s 2016 Top 10 Hospital C-Suite Watch List.